

POLYNOIDAE AND SIGALIONIDAE (POLYCHAETA) FROM
THE GUAYMAS BASIN, WITH DESCRIPTIONS OF
TWO NEW SPECIES, AND ADDITIONAL RECORDS FROM
HYDROTHERMAL VENTS OF THE GALAPAGOS
RIFT, 21°N, AND SEEP-SITES IN THE GULF OF
MEXICO (FLORIDA AND LOUISIANA)

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Abstract. — Eight species of scaled polychaetes are reported from hydrothermal vents of the Guaymas Basin in the Gulf of California: *Neoleanira racemosa* in the Sigalionidae and seven species of Polynoidae, including two new species, *Bathykurila guaymasensis*, in Macellicephalinae, and *Macellicephaloides alvini*, in Macellicephaloidinae. The latter genus and subfamily are reviewed, and a Key to the seven species in the genus is provided. Included are additional records of some species of Polynoidae from hydrothermal vents from the Galapagos and 21°N in the eastern Pacific, as well as seep-sites in the Gulf of Mexico Florida Escarpment and off Louisiana.

A small collection of scaled polychaetes from the Guaymas Basin in the Gulf of California or the Sea of Cortez was sent to me for study by J. F. Grassle. Hot vents and hydrocarbon seeps were discovered in this area in 1980 and sampled in 1982 during dives of the submersible DSRV *Alvin* (Lonsdale 1984, Grassle 1986). The area, a continuation of the East Pacific Rise into the Gulf of California, is covered by a thick layer of pelagic muddy sulfide sediment. The study site consists of mounds of hydrothermal precipitates in the spreading center troughs at about 2000 meters. The fauna included large numbers of the giant vestimentiferans, *Riftia*, giant clams, such as *Calyptogena pacifica*, nuculanid bivalves, alvinellid polychaetes, as *Paralvinella grasslei*, and fluffy mats of the large bacterium *Beggiatoa*.

Eight species of scaled polychaetes are reported herein from the Guaymas Basin, seven of them belonging to the Polynoidae and one to the Sigalionidae: *Neoleanira racemosa* (Fauchald), previously reported from the Guaymas Basin by Fauchald (1972, as

Sthenolepis). Of the polynoid species, five were previously described by me from other vent areas: one, *Branchiplicatus cupreus*, from the tropical eastern Pacific at 21°N; one, *Lepidonotopodium riftense*, the same area and the Galapagos Rift; and three, *Branchinotogluma grasslei*, *B. sandersi*, and *Levensteiniella kincaidi*, from the above two areas and also the Explorer and Juan de Fuca Ridges. The other two polynoid species are described below as new species: *Bathykurila guaymasensis*, in Macellicephalinae, and *Macellicephaloides alvini*, in Macellicephaloidinae. The specimens were collected during *Alvin* dives in 1982 and 1985, in washings from rock with worms, Bead Experiment washings, washings from Rock Chimney, washings from *Riftia*, *Calyptogena*, and alvinellid polychaetes, from Box cores taken on the slopes of the mounds, some with numerous nuculanid bivalves.

Some additional records of previously described vent fauna are included in this report, such as *Branchipolynoe symmytilida*, removed from some Galapagos mussels and sent to me in July 1985 by J. F. Grassle.

Also, specimens of *Branchipolynoe seepensis* were removed by Ruth Turner from Gulf of Mexico mussels collected in the seep-sites at the Florida Escarpment and sent to me in October 1986, by Barbara Hecker. An additional specimen of this species was collected in May 1987, by the US Navy submarine NR-1 and R/V *Gyre* and sent to me by T. H. Perkins. Additional vent polynoids from the Galapagos and the eastern Pacific Rise at 21°N, collected during *Alvin* dives in 1979 and 1982, chiefly among fauna in washings from mussels and crab traps, were sent to the Smithsonian Sorting Center for further sorting and transferred to me in December 1987. They supplement my previous studies on this group.

Types and additional specimens are deposited in the collections of the Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution (USNM).

Family Polynoidae

Subfamily Branchipolynoinae Pettibone, 1984

Genus *Branchipolynoe* Pettibone, 1984, emended Pettibone, 1986

Branchipolynoe symmytilida Pettibone

Branchipolynoe symmytilida Pettibone, 1984a:227, figs. 1–8.—Kenk & Wilson, 1985:264.—Desbruyères et al. 1985:104, 113, 114.—Grassle, 1986:326, 327, 336.

Material.—East Central Pacific, from dives of the *Alvin* on three vent areas along the Galapagos Rift in 1979, associated with deep-sea mussels, *Branchimodiolus thermophilus* Kenk & Wilson: Mussel Bed, 00°47.89'N, 86°09.21'W: Dive 880, 21 Jan, 2493 m, from 9 mussels, 9 specimens (USNM 98577). Dive 888, 13 Feb, 2493 m, from mussel, 1 specimen (USNM 98578). Dive 986, 3 Dec, 2494 m, mussel bucket washings, 1 specimen (USNM 118168). Dive 989, 6 Dec, 2482 m, from small mussels, 5 specimens (USNM 118171). Dive 991, 8 Dec, 2490 m, washings from 68 mus-

sels in mesh-lined milk crates, 5 specimens, (USNM 118170). Garden of Eden, 00°47.69'N, 86°07.74'W: Dive 883, 25 Jan, 2482 m, from mussel, 1 specimen (USNM 98579). Dive 884, 25 Jan, 2482 m, from 6 mussels, 7 specimens (USNM 98580) and 3 young specimens (USNM 118172). Dive 993, 10 Dec, 2518 m, slurp sample from base of vestimentiferans, 1 specimen (USNM 118166). Rose Garden, 00°48.25'N, 86°13.48'W: Dive 892, 17 Feb, 2454 m, from 3 mussels, 3 specimens (USNM 98581). Dive 894, 19 Feb, 2457 m, from 12 mussels, 12 specimens (USNM 98582). Dive 983, 30 Nov, 2457 m, mussel bucket residue, 2 young specimens (USNM 118167). Dive 984, 1 Dec, 2451 m, mussel washings left in clam bucket overnight, 13 specimens (USNM 118169); residue from retrieved box containing vestimentiferans, 1 small specimen (USNM 118173).

Remarks.—*Branchipolynoe symmytilida* has been found living commensally in the mantle cavities of the giant deep-sea vent mussels, *Branchimodiolus thermophilus* Kenk & Wilson (Pettibone 1984a, Kenk & Wilson 1985). Of the 37 polynoids taken from 36 mussels (USNM 98577–98582), 1 had a length of 40 mm; 14, lengths of 29–33 mm; 9, lengths of 21–25 mm; 10, lengths of 15–20 mm; 2, lengths of 11 mm; and 1, length of 6 mm. The two polynoids taken from a single mussel had lengths of 25 and 15 mm. The additional 31 specimens from 8 *Alvin* dives, taken mostly from mussel washings (USNM 118166–73), consisted of smaller worms: adults up to 11 mm in length, 3 mm in width, with 20 segments and 10 pairs of elytra; juveniles 3–4 mm in length, 1.5–2.2 mm in width, with 14–17 segments; and very young specimens 1.2–2 mm in length, 1 mm in width, with 11–12 segments.

According to observations by Desbruyères et al. (1985:104) on *B. symmytilida*, gut contents included pieces of mussel gills, coccoid and filamentous bacteria-like cells, and a mixture of crustacean molts, uniden-

tifiable worm setae, diatom frustules, and amorphous organic matter consistent with a mixed diet including living tissue and pseudofeces of mussels. Special features are their red blood, segmental arborescent branchiae, 10 pairs of elytra, and 20–21 segments.

Distribution.—East Central Pacific along Galapagos Rift, associated with Galapagos deep-sea mussels, in 2451–2518 m. Reported for 13°N by Desbruyères et al. (1985: 114).

Branchipolynoe seepensis Pettibone

Branchipolynoe seepensis Pettibone, 1986: 445, figs. 1–4.

Branchipolynoe sp. Hecker, 1985:470.

Material.—Gulf of Mexico, from dives of the *Alvin* in Oct 1986, Florida Escarpment, 26°01'46"N, 84°54'36"W, 3270 m: Dive 1753, commensal with mussels, 15 specimens (USNM 10151). Dive 1755, with mussels, 19 specimens (USNM 101503). Dive 1756, in washings and from broken mussels, 25 specimens (USNM 101502). Dive 1758, with mussels, 2 juveniles (USNM 101504).

Gulf of Mexico off Louisiana, 27°47'N, 91°30'W, 1097 m, Fla. Dept. Nat. Res., 5 Mar, EJ 87-127, 1987, Bush Hill Box 1, among mussels, collected by US Navy submarine NR-1, recovered on surface by R/V *Gyre*, cruise 87-G-2, one specimen (USNM 102844).

Remarks.—The additional 61 specimens from 4 *Alvin* dives (USNM 10151–4), associated with the unnamed Gulf of Mexico giant mussels (to be described and named by Ruth Turner and Barry Wilson) include adults and juveniles; some are larger than previously reported. Larger adults are 31–40 mm long, 14–17 mm wide, with 21 segments; smaller adults, 9–17 mm long, 4–8 mm wide, with 21 segments; larger juveniles, 5–9 mm long, 3–4.5 mm wide, with 17–19 segments; smaller juveniles, 3–4.5 mm long,

2–2.5 mm wide, with 15–16 segments; and the smallest juvenile, 2 mm long, 1.5 mm wide, with 14 segments. The single specimen from Bush Hill off Louisiana (USNM 102844) is 20 mm long, 8 mm wide, with 21 segments; it differs by having long ventral papillae on segment 12 only, not on both segments 11 and 12. The smaller juveniles lack both pairs of ventral papillae.

Distribution.—Gulf of Mexico, near hypersaline seeps at base of Florida Escarpment, associated with Gulf of Mexico mussels, in 3266–3270 m and off Louisiana, in 1097 m.

Subfamily Lepidonotopodiinae Pettibone, 1983

Genus *Lepidonotopodium* Pettibone, 1983

Lepidonotopodium riftense Pettibone

Lepidonotopodium riftense Pettibone, 1984b:852, figs. 2–4.

Material.—East Central Pacific, from dives of the *Alvin* on 3 vent areas along the Galapagos Rift in 1979: Mussel Bed, 00°47.89'N, 86°09.21'W: Dive 986, 3 Dec, 2494 m, mussel bucket washings, one specimen (USNM 118180). Garden of Eden, 00°47.09'N, 86°07.74'W: Dive 993, 10 Dec, 2518 m, slurp sample from base of vestimentiferans, three specimens (USNM 118181). Rose Garden, 00°48.25'N, 86°13.48'W: Dive 896-4, 21 Feb, 2460 m, six specimens (USNM 118184). Dive 983, 30 Nov, 2457 m, mussel bucket washings and crab trap residue, 13 specimens (USNM 118183). Dive 990, 7 Dec, 2451 m, washings from crab trap, 1 specimen (USNM 118185).

East Pacific Rise off western Mexico, 20°50'N, 109°06'W, Oasis *Alvin* dives in 1982: Dive 1220, 26 Apr, 2617 m, *Riftia* and *Calyptogena* washings, nine specimens (USNM 118182). Dive 1229, 14 May, 2615 m, *Riftia*, *Calyptogena* and *Alvinella* washings, eight specimens (USNM 118186).

Gulf of California, Guaymas Basin, dive

of the *Alvin* in Jan 1982, 27°01'N, 111°25'W, 2020 m. Dive 1170, rock sample, two small specimens (USNM 118708). Dives of the *Alvin* in 1985, 27°00'N, 111°24'W, 2000–2009 m: Dive 1603, 25 Jul, Angel Rock, bacterial mat, *Riftia* washings, three specimens (USNM 118707). Dive 1607, 29 Jul, Lutz 2, bacterial mat, washings from rocks worms, one specimen (USNM 118706). Dive 1609, 1 Aug, Lutz 2, sediment, bottom of bucket of Bead Exp. no. 1, one minute specimen (USNM 118705). Dive 1615, 7 Aug, smoker in hydrothermal area, *Riftia* washings, 16 specimens (USNM 118709).

Remarks.—Some specimens from the Guaymas Basin are larger than previously reported: up to 19 mm long, 9 mm wide, with 26 segments, compared to 13 mm long, 7 mm wide, with 25 segments.

Distribution.—Gulf of California, East Pacific Rise at 21°N, and East Central Pacific in the Galapagos Rift, in 2020–2633 m.

Lepidonotopodium williamsae Pettibone

Lepidonotopodium williamsae Pettibone, 1984b:857, figs. 5–7.

Material.—East Central Pacific, from dives of the *Alvin* on two vent areas along the Galapagos Rift in 1979: Mussel Bed, 00°47.89'N, 86°21'W: Dive 991, 8 Dec, 2490 m, washings from mussels in mesh-lined milk crates and slurp samples from mussel wall, eight specimens (USNM 118118–90). Rose Garden, 00°48.25'N, 86°13.48'W: Dive 990, 7 Dec, 2451 m, residue from retrieval box containing vestimentiferans, two specimens (USNM 118187).

East Pacific Rise off western Mexico, 20°50'N, 109°06'W, Oasis *Alvin* dive in 1982: Dive 1220, 26 Apr, 2617 m, *Riftia* and *Calyptogena* washings, three specimens (USNM 118188).

Distribution.—Hydrothermal vents of Tropical East Pacific, Galapagos Rift and East Pacific Rise at 21°N, in 2451–2633 m.

Subfamily Branchinotogluminae Pettibone, 1985

Genus *Branchinotogluma* Pettibone, 1985
Branchinotogluma grasslei Pettibone

Branchinotogluma grasslei Pettibone, 1985b:457, figs. 5, 6; 1988: 215.

Material.—East Central Pacific, Galapagos Rift, *Alvin* dives in 1979: Mussel Bed, 00°47.89'N, 86°09.21'W: Dive 991, 8 Dec, 2490 m, two slurp samples from mussel wall, three specimens (USNM 118151). Rose Garden, 00°48.25'N, 86°13.48'W: Dive 983, 30 Nov, 2457 m, mussel bucket washings, three specimens (USNM 118152).

East Pacific Rise off western Mexico, Oasis *Alvin* dive in 1982, 20°50'N, 109°06'W: Dive 1220, 26 Apr, 2617 m, *Riftia* and *Calyptogena* washings, one specimen (USNM 118150).

Gulf of California, *Alvin* dive in Guaymas Basin in Jan 1982, 27°01'N, 111°25'W: Dive 1172, 2010 m, Box core no. 1, on slope of mound in area of sulfides, sediment covered with white material, one specimen (USNM 118699).

Distribution.—Hydrothermal vents of Tropical East Pacific, Galapagos Rift and East Pacific Rise at 21°N; Gulf of California; Northeast Pacific, Explorer and Juan de Fuca Ridges, in 1495–2633 m.

Branchinotogluma sandersi Pettibone

Branchinotogluma sandersi Pettibone, 1985b:453, figs. 3, 4; 1988: 217.

Material.—East Central Pacific, Galapagos Rift, *Alvin* dives in 1979: Mussel Bed, 00°47.89'N, 86°09.21'W: Dive 991, 8 Dec, 2490 m, two slurp samples from mussel wall, two specimens (USNM 118157). Rose Garden, 00°48.25'N, 86°13.48'W: Dive 983, 30 Nov, 2457 m, mussel bucket washings, one specimen (USNM 118156). Dive 988, 5 Dec, 2450 m, slurp sample from base of vestimentiferans, one specimen (USNM 118158).

East Pacific Rise off western Mexico, Oasis *Alvin* dive in 1982, 20°50'N, 109°06'W: Dive 1220, 26 Apr, 2617 m, *Riftia* and *Calyptogena* washings, three specimens (USNM 118159).

Gulf of California, *Alvin* dive in Guaymas Basin in 1985, 27°00'N, 111°24'W: Dive 1599, 13 Jul, 2009 m, Lutz 2, bacterial mat, washing from Rock Chimney, one specimen (USNM 118700).

Distribution. — Hydrothermal vents of Tropical East Pacific, Galapagos Rift and East Pacific Rise at 21°N; Gulf of California; Northeast Pacific, Explorer and Juan de Fuca Ridges, in 1592–2633 m.

Branchinotogluma hessleri Pettibone

Branchinotogluma hessleri Pettibone, 1985b:450, figs. 1, 2.

Material. — East Central Pacific, Galapagos Rift, dives of *Alvin* in 1979: Mussel Bed, 00°47.89'N, 86°09.21'W: Dive 991, 8 Dec, 2490 m, two slurp samples from mussel wall, three specimens (USNM 118164). Garden of Eden, 00°47.69'N, 86°07.74'W: Dive 993, 10 Dec, 2518 m, slurp sample from base of vestimentiferans, four specimens (USNM 118162). Rose Garden, 00°48.25'N, 86°13.48'W: Dive 983, 30 Nov, 2457 m, mussel bucket washings, three specimens (USNM 118161). Dive 988, 5 Dec, 2450 m, slurp sample from base of vestimentiferans, one specimen (USNM 118163).

East Pacific Rise off western Mexico, Oasis *Alvin* dives in 1982, 20°50'N, 109°06'W: Dive 1220, 26 Apr, 2617 m, *Riftia* and *Calyptogena* washings, 13 specimens (USNM 118160). Dive 1229, 14 May, 2615 m, *Riftia*, *Calyptogena* and *Alvinella* washings, 2 specimens (USNM 118165).

Distribution. — Hydrothermal vents of Tropical East Pacific, Galapagos Rift and East Pacific Rise at 21°N, in 2450–2633 m.

Opisthotrochopodus Pettibone, 1985

Opisthotrochopodus alvinus Pettibone

Opisthotrochopodus alvinus Pettibone, 1985b:459, figs. 7–9.

Material. — East Central Pacific, Galapagos Rift, dives of *Alvin* in 1979: Mussel Bed, 00°47.89'N, 86°09.21'W: Dive 991, 8 Dec, 2490 m, two slurp samples from mussel wall, one specimen (USNM 118179). Garden of Eden, 00°47.69'N, 86°07.74'W: Dive 993, 10 Dec, 2518 m, slurp sample from base of vestimentiferans, 2 specimens (USNM 118177). Rose Garden, 00°48.25'N, 86°13.48'W: Dive 983, 30 Nov, 2457 m, mussel bucket washings, 11 specimens (USNM 118174), crab trap residue, 2 specimens (USNM 118176).

East Pacific Rise off western Mexico, Oasis *Alvin* dive in 1982, 20°50'N, 109°06'W: Dive 1220, 26 Apr, 2617 m, *Riftia* and *Calyptogena* washings two specimens (USNM 118178).

Distribution. — Hydrothermal vents of Tropical East Pacific, Galapagos Rift and East Pacific Rise at 21°N, in 2451–2633 m.

Branchinotogluma sp. A

[Young of *B. hessleri* or *O. alvinus*]

Branchinotogluma sp. A Pettibone, 1985b: 466.

Material. — East Central Pacific, from dives of *Alvin* along Galapagos Rift in 1979: Mussel Bed: Dive 991, 8 Dec, 2490 m, slurp sample from mussel wall, nine young specimens (USNM 118154). Garden of Eden: Dive 993, 10 Dec, 2518 m, slurp sample from base of vestimentiferans, two young specimens (USNM 118155). Rose Garden: Dive 983, 30 Nov, 2457 m, mussel bucket washings, 10 young specimens (USNM 118153).

Remarks. — Adults of the above two species were collected on the same dives.

Branchinotogluma sp. B

[Young of *B. grasslei* or *B. sandersi*]

Branchinotogluma sp. B Pettibone, 1985b: 466.

Material. — East Central Pacific, from dives of *Alvin* along Galapagos Rift in 1979: Rose Garden: Dive 983, 30 Nov, 2457 m,

mussel bucket washings, 11 young specimens (USNM 118149).

Gulf of California, *Alvin* dive in Guaymas Basin in 1985, 27°00'N, 111°24'W: Dive 1603, 25 Jul, 2004 m, Angel Rock, bacterial mat, *Riftia* washings, one small specimen (USNM 118701).

Remarks.—Adults of the above two species were collected on the same dives.

Subfamily Branchiplicatinae Pettibone, 1985

Genus *Branchiplicatus* Pettibone, 1985

Branchiplicatus cupreus Pettibone

Branchiplicatus cupreus Pettibone, 1985a: 151, figs. 1–4.

Material.—Gulf of California, *Alvin* dive in Guaymas Basin in 1982, 27°01'N, 111°25'W: Dive 1169-001, 11–20 Jan, 2020 m, rock sample, one specimen (USNM 118702). *Alvin* dive in 1985, 27°00'N, 111°24'W: Dive 1615, 7 Aug, 2000 m, smoker 1, hydrothermal area, *Riftia* washings, one specimen (USNM 118703).

Distribution.—Hydrothermal vents in Gulf of California and East Pacific Rise at 21°N, in 2000–2633 m.

Subfamily Macellicephalinae Hartmann-Schröder, 1971,
emended Pettibone, 1976

Genus *Levensteiniella* Pettibone, 1985

Levensteiniella kincaidi Pettibone

Levensteiniella kincaidi Pettibone, 1985c: 471, figs. 1–3; 1988:215.

Material.—East Central Pacific, Galapagos Rift, dives of *Alvin* in 1979: Mussel Bed, 00°47.89'N, 86°09.21'W: Dive 986, 3 Dec, 2494 m, mussel bucket washings, three specimens (USNM 118196). Dive 991, 8 Dec, 2490 m, slurp samples from mussel wall, four young specimens (USNM 118194). Garden of Eden, 00°47.69'W, 86°07.74'W: Dive 993, 10 Dec, 2518 m, slurp sample from base of vestimentiferans, 29 young specimens (USNM 118191). Rose Garden, 00°48.25'W, 86°13.48'W: Dive 983,

30 Nov, mussel bucket washings, 20 young specimens (USNM 118197). Dive 988, 5 Dec, 2450 m, slurp sample from base of vestimentiferans, one specimen (USNM 118192).

East Pacific Rise off western Mexico, 20°50'N, 109°06'W, Oasis *Alvin* dives in 1982: Dive 1220, 26 Apr, 2617 m, *Riftia* and *Calyptogena* washings, 10 specimens (4 young, USNM 118195). Dive 1229, 14 May, 2616 m, *Riftia*, *Calyptogena* and *Alvinella* washings, small specimen (USNM 118193).

Distribution.—Hydrothermal vents of Tropical East Pacific: Galapagos Rift and East Pacific Rise at 21°N; Northeast Pacific, Explorer and Juan de Fuca Ridges, in 1818–2633 m.

Genus *Bathykurila* Pettibone, 1976

Bathykurila guaymasensis, new species

Figs. 1, 2

Material.—Gulf of California, *Alvin* dive in Guaymas Basin in Jan 1982, 27°01'N, 111°25'W: Dive 1176, 2020 m, Box core 2, taken over vent, with numerous nuculanid bivalves, 2d, holotype (USNM 118694) and paratype (USNM 118695); sec. B, paratype (USNM 118696). *Alvin* dive in 8 Aug 1985, 27°00'N, 111°24'W: Dive 1614, 2004 m, Angel Rock, bacterial mat, Box core 5, subcore B, 0–5 cm, paratype (USNSM 118697), subcore C, 0–3 cm, paratype (USNM 118698).

Description.—Length of holotype 8 mm, width with setae 5 mm, segments 15; length of two larger paratypes 7 mm, width 5 mm, segments 14; length of two smaller paratypes 3–4 mm, width 3–3.5 mm, segments 15. Body fusiform, flattened, with parapodia and setae very long, projecting, longer than body width (Fig. 1A, B).

Elytra (mostly missing) and large, bulbous elytophores (Figs. 1A, B, 2A) seven pairs, on segments 2, 4, 5, 7, 9, 11, and 13. Elytra large, oval, covering dorsum, delicate, with larger conical to rounded tubercles variable in size on posterior and lateral borders, with smaller ones scattered on sur-

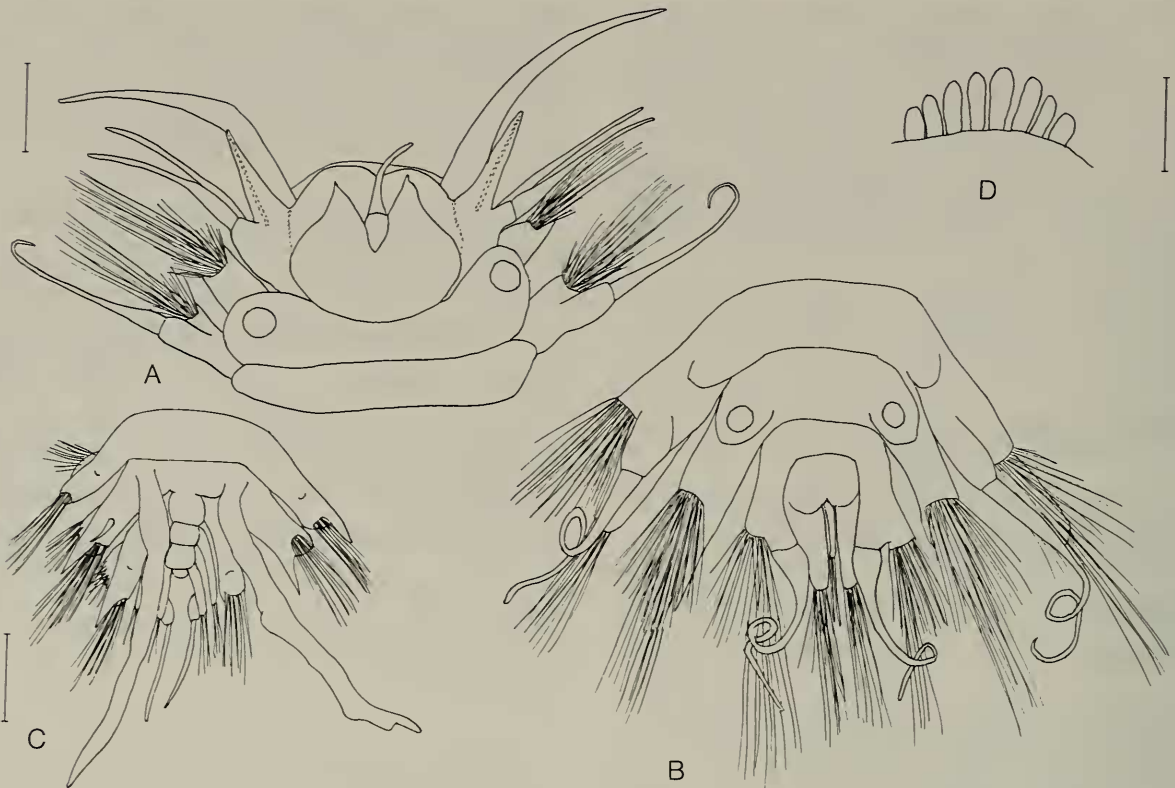


Fig. 1. *Bathykurila guaymasensis*, A, B, holotype, USNM 118694; C, paratype, USNM 118698; D, paratype, USNM 118695: A, Dorsal view of anterior end, acicula in tentaculophores of 1st segment dotted; B, Dorsal view of posterior end (segments 12–15); C, Ventral view of posterior end (segments 10–14), anal cirri and most of ventral cirri broken off; D, Border papillae on dorsal side of pharynx (dissected). Scales = 0.5 mm for A, B; 1.0 mm for C; 0.1 mm for D.

face (Fig. 2F): larger tubercles not usual type, not chitinous, not sharply set off from surface. Dorsal tubercles on cirriferous segments large, bulbous to nodular (Figs. 1A, B, 2B).

Prostomium oval, deeply bilobed; triangular anterior continuations of prostomium with small frontal filaments; median antenna with small ceratophore in anterior notch, with short subulate style; without lateral antennae and eyes; palps stout, tapered, about two times longer than prostomium (Fig. 1A). First or tentacular segment fused to prostomium, not visible dorsally; tentaculophores lateral to prostomium, each with prominent acicular lobe on inner side, without setae, and pair of subulate tentacular cirri, shorter than palps; upper lip large, bilobed (Fig. 1A). Second or buccal segment with first pair of elytraphores, biramous parapodia and ventral or buccal cirri lateral to ventral mouth, longer than following ventral cirri (Fig. 1A).

Parapodia biramous, with notopodia shorter and smaller than neuroodia (Fig. 2A, B.) Notopodium rounded basally, with projecting acicular lobe on lower side; neuropodium with conical projecting presetal acicular lobe and shorter, rounded postsetal lobe. Notosetae numerous, short to longer, forming radiating bundles, stouter than neurosetae, with row of widely spaced teeth (4–11) along one side and blunt tips (Fig. 2C). Neurosetae very numerous, forming fan-shaped bundles; supraacicular neurosetae with longer spinous regions and two rows of long spines, tapering to bluntly pointed bare tips (Fig. 2D); subacicular neurosetae with shorter spinous regions, close-set short spines, and tapered bare tips (Fig. 2E). Dorsal cirri with cylindrical cirrophores on posterior sides of notopodia, shorter than notopodia, with styles wider basally and long slender tips extending to tips of setae or beyond (Figs. 1A, B, 2B).

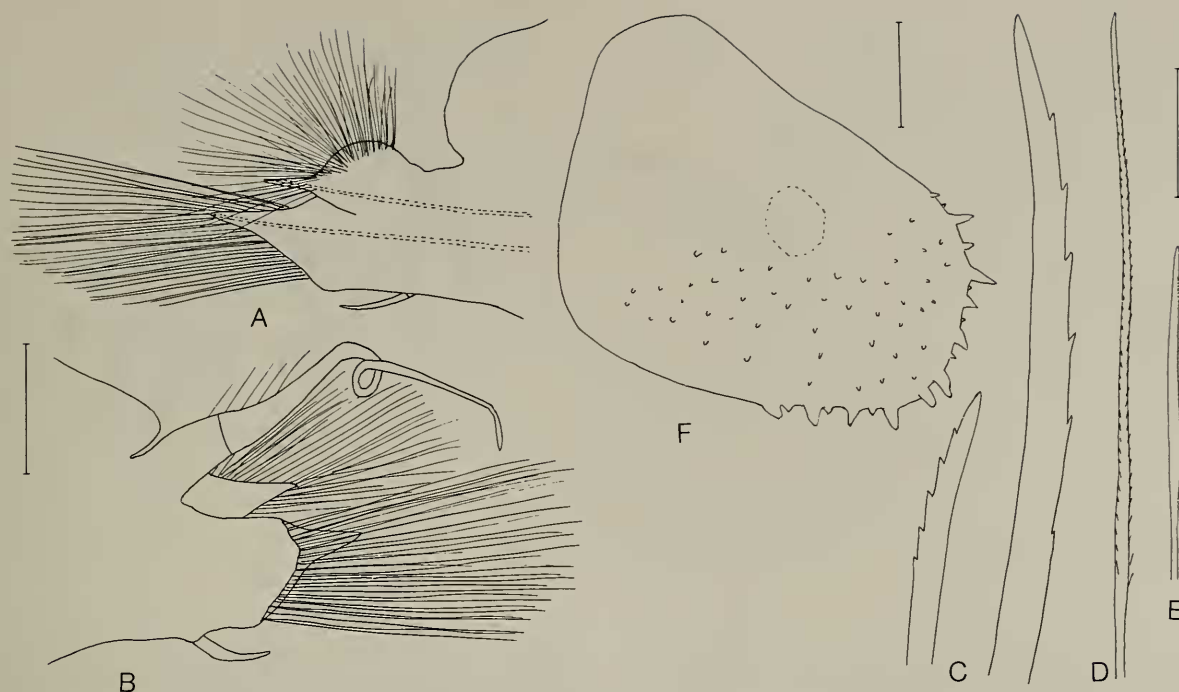


Fig. 2. *Bathykurila guaymasensis*, holotype, USNM 118694: A, Right elytragerous parapodium, anterior view, acicula dotted; B, Right cirriferous parapodium, posterior view; C, Notosetae; D, Supraacicular neuroseta; E, Subacicular neuroseta; F, Right elytron. Scales = 0.5 mm for A, B; 0.1 mm for C–E; 0.5 mm for F.

Ventral cirri attached on middle of neuropodia, short, tapered (Fig. 2A, B).

Pair of long ventral papillae usually present on segment 11 (present on four of five specimens), sometimes extending far beyond posterior end, with yellowish secretion inside (Fig. 1C). Posterior 2 segments (14, 15) smaller, enclosed in elytragerous segment 13 (Fig. 1B); segment 14 with dorsal cirri; segment 15 smaller, without dorsal cirri (Fig. 1B), or segment absent (Fig. 1C); pygidium long, slender, wedged between parapodia of segment 15, with pair of slender, short anal cirri (Fig. 1B).

Pharynx (dissected) with opening encircled by eight pairs of border papillae (Fig. 1D), and two pairs of heavy, hooked jaws.

Etymology.—The species is named for the collecting site, the Guaymas Basin.

Remarks.—*Bathykurila guaymasensis* is close to *B. zenkevitchi* (Uschakov 1955, fig. 1a–c; Pettibone 1976, fig. 24a–d), the type species of *Bathykurila*, from the Kurile-Kamchatka Trench in the northwest Pacific, in 8100 m. They differ as indicated in Table 1.

Subfamily Macellicephaloidinae Pettibone, 1976

Genus *Macellicephaloides* Uschakov, 1955

Type species.—*Macellicephaloides grandicirrus* Uschakov, 1955 (as *grandicirra*). Gender: masculine (according to the Code, Art. 30.a.i, names ending in *-oides* should be masculine, not feminine, as indicated by Pettibone 1976:42).

Table 1.—Differences between *Bathykurila zenkevitchi* (Uschakov) and *Bathykurila guaymasensis*, n. sp.

Character	<i>B. zenkevitchi</i>	<i>B. guaymasensis</i>
Tentacular cirri	about as long as palps	shorter than palps
Notopodia	as long as or longer than neuropodia	shorter than neuropodia
Cirrophore of dorsal cirri	longer than notopodia	shorter than notopodia
Ventral papillae	4 pairs on segments 10–13	1 pair on segment 11
Length	15–21 mm	3–8 mm
Width	12 mm	3–5 mm
Segments	15	14–15



Fig. 3. *Macellicephaloides alvini*, holotype, USNM 118704: A, Dorsal view of anterior end, styles of median antenna, tentacular cirri, and dorsal cirri of segment 3 missing, right parapodia of segments 2 and 3 damaged or not developed; B, Ventral view of anterior end, ventral cirri missing; C, Dorsal view of posterior end (segments 13–17), elytra and styles of dorsal cirri missing. Scale = 1.0 mm for A–C.

Macellicephaloides alvini, new species

Figs. 3, 4

Material.—Gulf of California, *Alvin* dive in Guaymas Basin, F. Grassle, collector, Dive 1614, 6 Aug 1985, 27°00'N, 111°24'W: 2004 m, Angel Rock, bacterial mat, Box core 5, subcore D, holotype (USNM 118704).

Description.—Length of holotype 7.5 mm, width with setae 4 mm, segments 17. Body flattened dorsoventrally, tapering slightly anteriorly and more so posteriorly, with parapodia of 5 posterior segments directed posteriorly (Fig. 3C). Integument smooth, not papillate. Elytra (all missing) and large, bulbous elytophores eight pairs, on segments 2, 4, 5, 7, 9, 11, 13, and 15 (Figs. 3A, C, 4A). Dorsal tubercles on cirriferous segments indistinct.

Prostomium (poor condition) withdrawn and fused to tentacular segment, oval, slightly bilobed; ceratophore of median antenna in middle of prostomium, style missing; palps on short palpophores, rather short, tapering; without lateral antennae and eyes (Fig. 3A, B). Tentacular segment distinct dorsally, ventrally forming upper, lateral, and posterior lips of ventral mouth; tenta-

culophores of dorsal and ventral cirri short, lateral to prostomium, styles missing (Fig. 3A, B). Segment 2 with first pair of elytophores and elongate parapodia; ventral cirri missing; deep depression in middle of ventral surface, covered by large, oval flap attached to segment 3 (Fig. 3A, B).

Parapodia subbiramous; notopodium bulbous basally, with projecting, stout, amber-colored notoaciculum, without notosetae (Fig. 4A–C); neuropodium elongated, with projecting acicular lobe; neurosetae numerous, delicate, slender, slightly wider basally, tapering to slender tips, with two rows of delicate spines (Fig. 4A, B, D). Posterior five segments with notoacacula stouter, projecting beyond neuropodia (Fig. 3C). Dorsal cirri with rather long, thick, cylindrical cirrophores on posterior dorsal sides of notopodia; styles missing (Fig. 4B). Ventral cirri missing.

Pygidium rounded, enclosed in parapodia of last segment (Fig. 3C). Pharynx (dissected) large, muscular; anterior end encircled with papillae, number and arrangement not evident but with longer lateral pair (not extra long as in *M. vitiazi*); two pairs of long V-shaped hooked jaws; dorsal pair fused medially, with additional median piece (Fig.

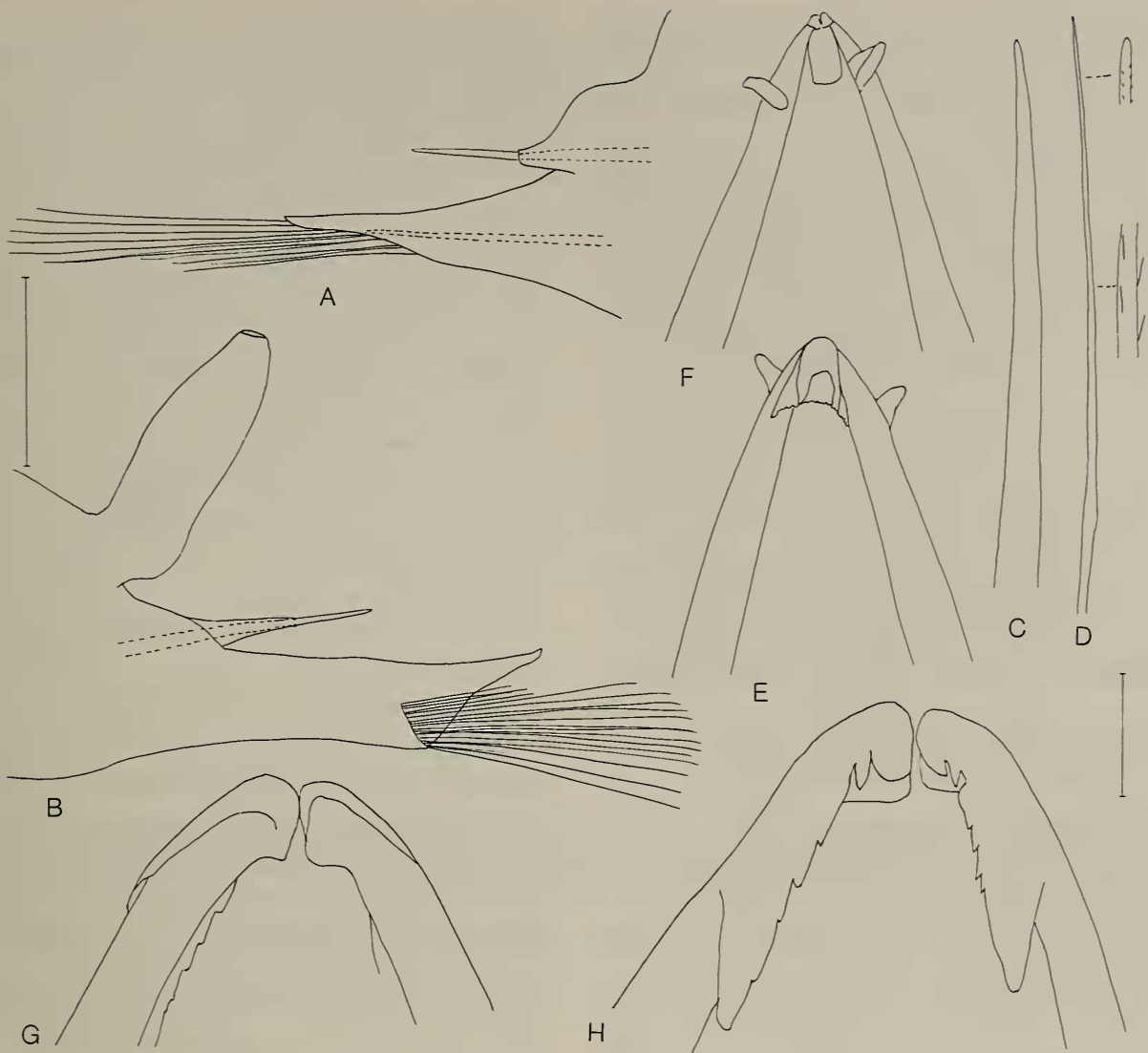


Fig. 4. *Macellicephaloides alvini*, holotype, USNM 118704: A, Right elytragerous parapodium from segment 7, anterior view, acicula dotted, elytron and ventral cirri missing; B, Right cirriferous parapodium of segment 8, posterior view, styles of dorsal and ventral cirri missing; C, Notoaciculum from same; D, Neuroseta from same, with detail of parts; E, Dorsal jaws, outer view; F, Same, inner view; G, Ventral jaws, outer view; H, Same, inner view. Scales = 0.5 mm for A, B; 0.1 mm for C–H.

4E, F); ventral pair denticulate on inner side (Fig. 4G, H).

Etymology.—The species is named for the collecting submersible, DSRV *Alvin*.

Remarks on the genus *Macellicephaloides* Uschakov, 1955, and the subfamily Macellicephaloidinae Pettibone, 1976: Of particular interest is the find of a single specimen from the Guaymas Basin that seems to fit into the genus *Macellicephaloides*, established by Uschakov (1955) for three ultra-abyssal species, *M. grandicirrus*, *M. verrucosus*, and *M. vitiazi*, from the Kurile-Kamchatka Trench in 7210–9950 m. Uschakov placed the genus under Aphroditidae:

Polynoinae. An additional species, *M. uschakovi*, was added to the genus from the same area in 8120 m by Levenstein (1971).

In her catalogue, Hartman (1959:93) placed *Macellicephaloides* under Polynoidea: Lepidonotinae, and selected *M. grandicirrus* as the type species. Hartmann-Schröder (1974), in her revision of the subfamily Macellicephalinae Hartmann-Schröder, 1971, included *Macellicephaloides* in the subfamily. As a part of my revision of the genus *Macellicephalo* and the subfamily Macellicephalinae Hartmann-Schröder, I established the new subfamily Macellicephaloidinae for *Macellicepha-*

loides and the above four species, with supplementary descriptions, based on specimens sent in exchange by P. Uschakov and R. Levenstein.

Levenstein (1975) added an additional species, *M. sandvichensis*, from the South Sandwich Trench in 7200–7934 m. Another species, *M. villosus*, was added by Levenstein (1982) from the Japan Trench in 7370–7380 m. Levenstein (1983) added a seventh species, *M. improvisus*, from the Kurile-Kamchatka Trench in 8035–8120 m and included a Key to the seven species of *Macellicephaloides*. It probably should be noted that Uschakov (1982) did not recognize the subfamily Macellicephaloidinae and other subfamilies proposed by Pettibone but included the genus under Macellicephalinae.

In her review of the genera and species of the deep-sea polynoid subfamilies in the world oceans, Levenstein (1984:83, fig. 4) indicated that the distributional pattern of the Macellicephaloidinae showed a western Pacific origin, since six of the seven species of the genus *Macellicephaloides* were known to inhabit trenches of the western Pacific and only one species was known to inhabit the Atlantic sector of the Antarctic Ocean, the South Sandwich Trench. She suggested that representatives of this genus (or its ancestor) were probably widely distributed in the abyssal region of the Pacific Ocean and gave rise to species adapted to life in the oceanic trenches, producing the ultra-abyssal fauna of this subfamily. The presence of *M. sandvichensis* in the South Sandwich Trench could be explained on the basis of a close connection between the deep-sea faunas of the Pacific and Atlantic sectors of the Antarctic. The new species, *M. alvini* from 4000–5000 m shallower waters in the Gulf of California, might be considered to be close to the ancestor of the genus. It is considerably smaller than representatives from the other areas.

All eight species have a relatively small number of segments (16–21, 1st achaetous) and eight pairs of elytraphores (elytra all

missing) on segments 2, 4, 5, 7, 9, 11, 13, and 15. The prostomium is relatively small, bilobed, with the ceratophore of the median antenna in the middle of the prostomium and with palps but without lateral antennae or eyes. The first or tentacular segment encloses the prostomium and is distinct dorsally, with two pairs of tentacular cirri on tentaculophores, but without acicular lobes or setae; ventrally the tentacular segment forms the upper, lateral, and posterior lips of the ventral mouth. The second segment has the first pair of elytraphores, large parapodia, and ventral cirri, with a deep mid-ventral depression covered by a large oval flap attached to segment 3 (as in *M. alvini*, Fig. 3B) or a rectangular flap (as in *M. grandicirrus*, Pettibone, 1976, fig. 25b). Parapodia are elongate, subbiramous, the notopodium represented by a conical lobe with a more or less projecting, stout notoaciculum, without notosetae; the neuropodium is conical, with numerous, slender neurosetae. Dorsal cirri on the non-elytragerous segments have moderately to very long, cylindrical cirrophores and short styles; dorsal tubercles are indistinct or rarely nodular, as in *M. verrucosus*. Ventral cirri are short. The pygidium is enclosed in the long parapodia of a variable number of posterior segments, and without anal cirri. The integument is smooth, rarely papillate dorsally, as in *M. villosus*, or with middorsal nodular tubercles, as in *M. verrucosus*. The large muscular pharynx has two pairs of hooked jaws and distal papillae, the lateral pair of papillae longer than the others. Lateral papillae sometimes very long, as in *M. vitiazi* (Pettibone, 1976, fig. 26c) and *M. sandvichensis* (Levenstein, 1975, fig. 3a), and similar to those of the pelagic polychaete family Alciopidae.

Key to the Species of *Macellicephaloides*

- | | |
|------------------------------|---|
| 1. Segments 16 or 17 | 2 |
| – Segments 18 or 20–21 | 6 |
| 2. Segments 16 | 3 |
| – Segments 17 | 4 |

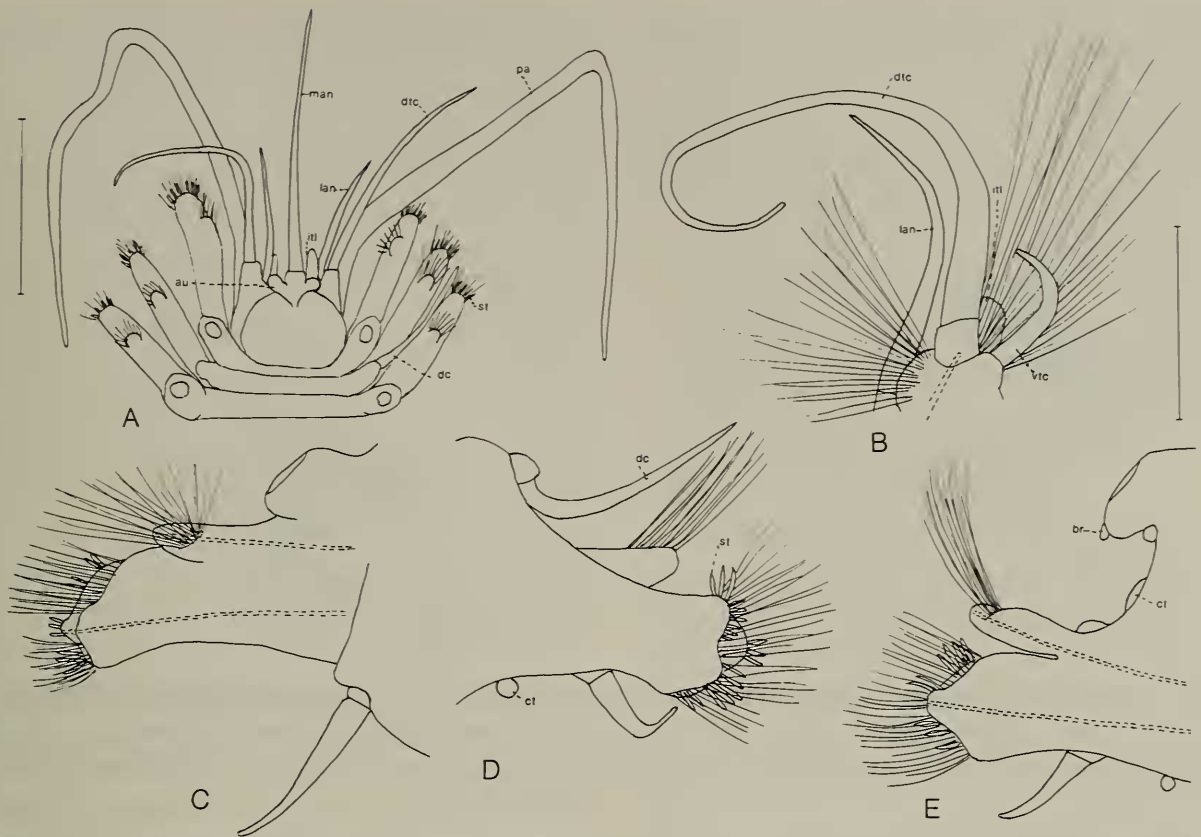


Fig. 5. *Neoleanira racemosa*, USNM 118714: A, Dorsal view of anterior end, ventral tentacular cirri not visible; left dorsal cirrus on segment 3 broken off; B, Right tentacular parapodium, outer view, aciculum dotted; C, Right elytragerous parapodium from segment 2, anterior view, acicula dotted; D, Right cirriferous parapodium from segment 3, posterior view; E, Right elytragerous parapodium from segment 4, anterior view, acicula dotted. Scales = 1.0 mm for A; 0.5 mm for B–E. au, auricle; br, branchia; ct, ctenidium; dc, dorsal cirrus; dte, dorsal tentacular cirrus; itl, inner tentacular lobe; lan, lateral antenna; man, median antenna; pa, palp; st, stylode; vtc, ventral tentacular cirrus.

- 3. With paired, nodular dorsal tubercles on cirriferous segments 6–14 and middorsal tubercles on segments 3–15 (Uschakov 1955, fig. 3; 1982, pl. 12; Pettibone 1976, fig. 27) *M. verrucosus* Uschakov
- Without dorsal tubercles on cirriferous segments and middorsal tubercles (Uschakov 1955, fig. 4; 1982, pl. 13; Pettibone 1976, fig. 26) *M. vitiazi* Uschakov
- 4. Notoacicula not extra stout or long. Cirrophores of dorsal cirri extending to about tips of neuropodia. Pharynx with pair of very long lateral papillae (Levenstein 1975, fig. 3) *M. sandvichensis* Levenstein
- Notoacicula stout, extending far beyond neuropodia in posterior segments. Pharynx with lateral papillae not extra long 5
- 5. Cirrophores of dorsal cirri extending far beyond tips of neuropodia (Uschakov 1955, fig. 2; 1982, pl. 11; Pettibone 1976, fig. 25) *M. grandicirrus* Uschakov
- Cirrophores of dorsal cirri not as long, extending to tips of neuropodia or shorter (Figs. 3, 4) *M. alvini*, new species
- 6. Segments 18. Cirrophores of dorsal cirri very short. Notopodia with flexible, thin acicula (Levenstein 1983, fig. a–c) *M. improvisus* Levenstein
- Segments 20–21. Notopodia otherwise 7
- 7. Dorsal side of body with conical pa-

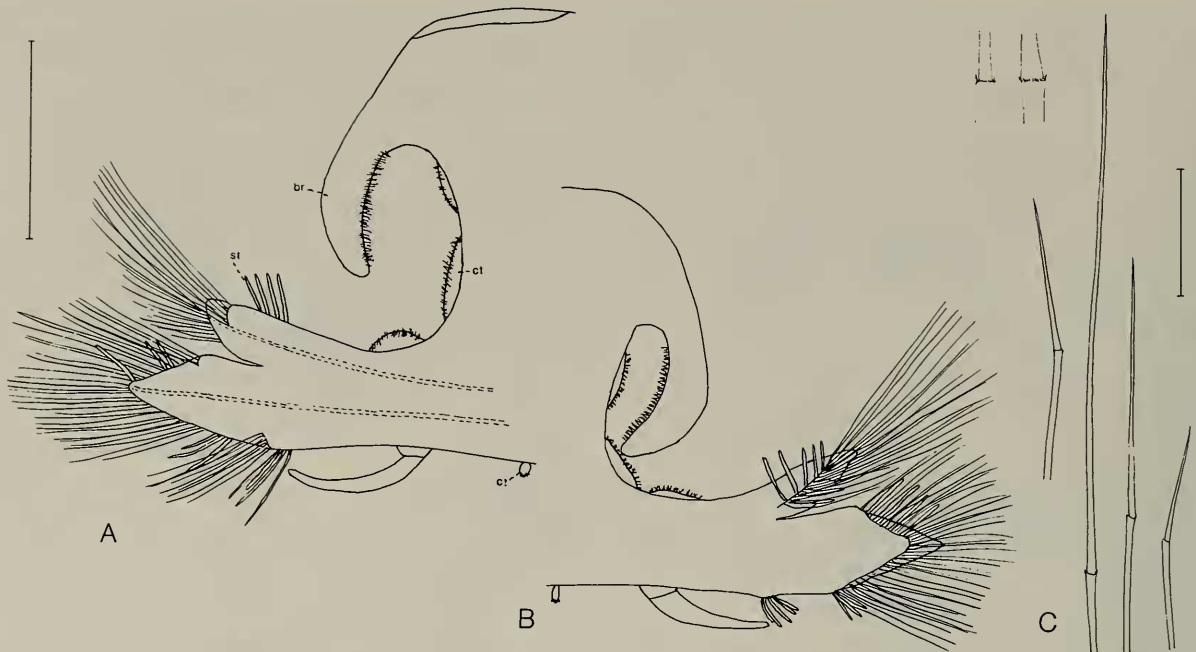


Fig. 6. *Neoleanira racemosa*, USNM 118714: A, Right parapodium from posterior region (about segment 35), anterior view, acicula dotted; B, Same, posterior view; C, Upper, middle, and lower compound neurosetae, with detail of distal part of stems. Scales = 0.5 mm for A, B; 0.1 for C. br, branchia; ct, ctenidium; st, stylode.

- pillae (Levenstein 1982, fig. 2) ...
 *M. villosus* Levenstein
 – Integument smooth (Levenstein
 1971, fig. 6) .. *M. uschakovi* Levenstein

Family Sigalionidae

Genus *Neoleanira* Pettibone, 1970

Neoleanira racemosa (Fauchald)

Figs. 5, 6

Sthenolepis racemosa Fauchald, 1972:34,
 pl. 2, figs. a–d.

Neoleanira racemosa.—Fauchald & Han-
 cock, 1981:23.

Remarks.—The species was originally de-
 scribed by Fauchald (1972) under *Stheno-*
lepis, based on specimens collected in the
 Guaymas Basin in 1774–2259 m and later
 referred to *Neoleanira* by Fauchald and
 Hancock (1981), with additional specimens
 reported from off central Oregon in 2000–
 2900 m. The additions to the description of
 the species are based on additional speci-
 mens from the Guaymas Basin. All speci-
 mens are incomplete posteriorly and elytra
 are missing in both the previous and the
 present collections.

Material.—Gulf of California, *Alvin* dives

in Guaymas Basin, Jan 1972, 27°01'N,
 111°25'W, 2020 m: Dive 1170, 2 m from
 vestimentiferans, Box core 1, small speci-
 men (USNM 118713). Dive 1173, on slope
 of mound, Box core 1, one specimen (USNM
 118714), Box core 2b, subcore D, two spec-
 imens (USNM 118715). Dive 1174, about
 15 m from mound, Box core 1a, one spec-
 imen (USNM 118712), Box core 1c, one
 small specimen (USNM 118710). Dive
 1177, about 3 m from mound with tube
 worms, Box core 2, one specimen (USNM
 118711).

Supplementary description.—Incomplete
 specimen of 44 segments, 16+ mm long, 3
 mm wide with setae (USNM 118714). Ely-
 tra all missing; elytophores on segments 2,
 4, 5, 7, continuing on alternate segments to
 23, then on all segments. Prostomium
 rounded, ceratophore of median antenna on
 anterior margin, with pair of lateral auricles
 and long tapering style; parapodia of first or
 tentacular segment partially fused to lateral
 and anterior sides of prostomium, with long
 lateral antennae attached on dorsal, inner
 side; long dorsal and short ventral tenta-
 cular cirri with short inner tentacular lobe;
 long tapering palps inserted ventral to ten-

tacular parapodia; with aciculum and 2 radiating bundles of capillary setae (Fig. 5A, B).

Parapodia of segments 2 and 3 directed anteriorly (Fig. 5A). Segment 2 with first pair of elyrophores, biramous parapodia, and ventral buccal cirri longer than following ventral cirri (Fig. 5A, C). Parapodium of segment 3 with long dorsal cirrus on short cirrophore and small oval ventral ctenidium medial to ventral cirrus (Fig. 5A, D). Segment 4 with 3 oval ctenidia between dorsal base of notopodium and elyrophore, with very small lateral branchia (Fig. 5E). Anterior neuropodia with numerous fimbriae or stylodes on tips of acicular lobes and bilobed posterior bracts (Fig. 5C–E).

More posterior parapodia with well-developed branchiae attached to lateral sides of elyrophores or dorsal tubercles and 3 ciliated ctenidia in curved part; notopodium with stylodes and long capillary notosetae, finely to coarsely spinous; neuropodium conical, with stylodes, fan-shaped bundle of slender neurosetae, ventral cirrus, and small bulbous ventral ctenidium (Fig. 6A, B). Neurosetae compound spinigers, upper and lower ones with shorter blades, middle ones with longer blades, none canaliculate; long slender shafts distally dentate (Fig. 6C).

Distribution.—Gulf of California and off Central Oregon. In 1774–2900 m.

Key to the Species of *Neoleanira*

- 1. Blades of compound spinigerous neurosetae not canaliculate. Ventral ctenidia small, bulbous. Branchiae without prominent spurlike processes. Elytra missing (Figs. 5, 6; Fauchald 1972, figs. a–d)
 *N. racemosa* (Fauchald)
- Blades of compound spinigerous neurosetae canaliculate 2
- 2. Elytra with borders entire, without lateral fringes of papillae. [Ventral ctenidia small, clavate. Branchiae without prominent basal spurlike processes] (Pettibone 1970, fig. 7)

- *N. magellanica* (McIntosh)
- Elytra with delicate lateral fringes of papillae 3
- 3. Ventral ctenidia small, clavate. Branchiae without prominent basal spurlike processes (Pettibone 1970, figs. 1–4) *N. tetragona* (Oersted)
- Ventral ctenidia large, boot-shaped. Branchiae with prominent basal spurlike processes (Pettibone 1970, figs. 5, 6) *N. areolata* (McIntosh)

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